

EXAMINING THE PERCEIVED NIGERIAN UNIVERSITIES LECTURERS TECHNOLOGY LITERACY LEVEL USING UNESCO COMPETENCY FRAMEWORK

ADEYANJU Olugbade Lawrence
Department of Curriculum and Instruction,
School of Education,
The College of Education, Lanlate

Abstract

One of the approaches to education reform that correspond to alternative, somewhat overlapping approaches to improve a country's workforce and fostering economic growth is technology literacy. The level of university lecturers' technology literacy approach is so important to determine their contribution to community development through the six components of education system. This study used the technology literacy approach of the UNESCO ICT-CFT to determine university lecturers' use of ICT for instruction. The study revealed that university lecturers perceived their technology literacy approach to instruction to be positive having 75.92%. The study concluded that the use of ICT through the approach will help in connecting education reform initiatives to the nation's economic and social development goals by explicitly including the 21st century skills that are needed to create new knowledge and engage in life-long learning as required in the education system. The study recommended among others that Government and University authorities should increase on the provision of new technologies and training for lecturers.

Keywords: *University, Technology Literacy Approach, Instruction*

Introduction

Technology is the use of knowledge and processes to solve problems and extend human capabilities which can also be anything people do to modify the natural world to meet human needs. The ability to use, manage, assess, and understand technology is referred to as technology literacy. Technological literacy encompasses three interdependent dimensions which are knowledge, ways of thinking and acting; and capabilities. These three dimensions are important to teaching and learning because technology affects almost every phase of our current and future lives which education is inclusive as it's enables lecturers to deliver their lecturers easily and supports their ability to make informed, responsible decisions that affect them as individuals, society as a whole, and the environment. In developing countries like Nigeria, the demands for the educational system to develop their technology literacy can no longer be allowed to happen by coincidence as technological literacy is a new basic and should become an integral portion of a the education sector.

The proliferation of new technologies is fundamentally changing the way of instruction in Nigeria, most especially in University education. The University education in Nigeria is no exception with technology having a major impact on the way instructions are been delivered (Attwell, 2010). Teaching with technology facilitate and enhance delivering of instruction; it can be represented as a continuum, moving from the traditional classroom-based or face-to-face learning, supported by technology, to a more flexible, blended approach which makes significant use of technology and reduces face-to-face contact, on to a fully online approach which is entirely dependent on technology (Dkit, 2013). Various technological devices such as computer, laptop, mobile phone and Personal Digital Assistants (PDAs) can be used for active teaching; MacDonald (2005) stated that the use of technological devices for instruction delivering is a process whereby lecturers are actively engaged in constructing knowledge in a meaningful, realistic context through exploration, reflection and social discourse with the learners.

The twenty first century fast-paced world is becoming increasingly characterised by technology-driven communication, which has transformed the world into a large globally connected community with ever

increasing outreach of information and communication technology (ICT). ICT refers to the range of the technologies that are applied in the process of collecting, storing, editing, retrieving and transferring of information in various forms. One of the best key areas for ICT applications is the education system as ICT is often seen as an instrument that brings changes in the teaching styles, learning approaches and in access to information. ICTs can help by providing alternative possibilities for education (Woodford, 2014).

UNESCO (2012) pointed out that information and communication technologies are essential tools in any educational system. The use of ICT is inevitable for teachers during instruction because the current learners are the digital natives who can retrieve required information within a short time, access and disseminate information such as e-books and e-journals which can be used for learning at their own pace. Jegede (2009) affirmed that teachers need the basic ICT skills for instruction as a classroom practitioner but is the least possessed by teachers. Teachers are a vital link in the education chain, and for education to truly respond to the needs of the 21st century, they must play a central role in using ICT tools or facilities in teaching and learning through the necessary skills required which is their competency level.

Teachers need to acquire a certain competency level in ICT to be able to function effectively in the profession. Regardless of the quantity and quality of ICT available for the teaching and learning processes, the key to how ICTs are used is the teacher; therefore, teachers must have the competence to exhibit the right attitude towards ICT (Jegede, 2009). ICT competence is the ability to combine and apply relevant skills to tasks required in the process of using ICT for teaching and learning. These skills include high levels of knowledge, values, skill, personal dispositions, sensitivities and capabilities, and the ability to put those combinations into practice in an appropriate way for teaching and learning (Knezek & Christensen 2008). For teachers to be competent in the use of ICT, the teacher should be able to bring together all the attributes required in the use of ICT for teaching.

There is the need for continuous acquisition of skills by teachers as teachers are required to decide how to make appropriate educational use of ICT in the classroom, where there are no longer lecture-based or didactic teaching methods in classrooms any more. In other words, teachers need to upgrade their skills and knowledge in the field of ICT as well as in other subjects. It is important that teachers and government see the need for skills acquisition to effectively use the technology created by multimedia in the teaching process. This training would be better, achieved through professionalisation. However, teachers need to be trained in personal skills in use of ICT, professional skills and competence in ICT, such as understanding the relevance of ICT in education, understanding the importance of ICT in teaching and learning, understanding how to plan ICT for teaching and learning across the curriculum, and managing ICT in the classroom is vital.

Globally, education policymakers have been formalising all-inclusive ICT policies as part of educational renewal and reform at all levels of education. At the international level, policy for integrating ICT for development was first formulated in the Millennium Development Goals (MDGs), which states that in cooperation with the private sector, benefits of new technologies, especially information and communications should be made available (UNESCO, 2008). UNESCO, (2008) and (2011) concluded that ICT is beyond a mere delivery mechanism but also enhances the pedagogy as it changes the nature of teaching and learning. ICT helps to bring abstract concepts to life using images, sounds, movement, animations and simulations. In any case, a better understanding of ICT and their impact on student outcomes are priorities in all countries, regardless of level of economic development (UNESCO, 2012). In Nigeria, ICT policies is with a mission statement “USE IT” for education and one of the general objectives is to ensure ICT resources are readily available to promote efficient national development which education through the tertiary institutions.

Tertiary institutions shall contribute to national development through high level relevant human power training, it is therefore, mandatory that tertiary institutions lecturers must be active participants in this

modern Information and Communication Technology Society (Olafare, 2014). ICT in tertiary institutions such as the university has a multiplier effect throughout the education system, by enhancing learning and providing students and the community with new sets of skills; by reaching students with poor or no access (especially those in rural and remote regions); by facilitating and improving the training of lecturers; and by minimizing costs associated with the delivery of instruction.

In this line UNESCO in 2008 raised a standard competency level for teachers in the use of ICT which starts from the training level. UNESCO ICT Competency Standards for Teachers (ICT-CST) was raised to improve teachers' practice in all areas of their work. UNESCO (2012) perceived that teachers can combine ICT skills with emergent views in pedagogy, curriculum, and school organization with a designed standard for the professional development of teachers who will use ICT skills and resources to improve their teaching, collaborate with colleagues, and perhaps ultimately become innovation leaders in their institutions. The objective of the ICT Competency Standards for Teachers (ICT-CST) is not only to improve teacher practice but to do it in a way that contributes to a higher quality education system which can, in turn, produce a better informed citizenry and higher quality workforce that, as a result, advances a country's economic and social development.

UNESCO's ICT Competency Standards for Teachers provides a framework that allows teacher professional development providers to connect their course offerings to the broader national educational improvement and economic development policy goals, To constitute a common set of guidelines that professional development providers can use to identify, develop or evaluate learning materials or teacher training programs in the use of ICT in teaching and learning, to provide a basic set of qualifications that allows teachers to integrate ICT into their teaching and learning, to advance student learning, and to improve other professional duties, to extend teachers' professional development so as to advance their skills in pedagogy, collaboration, leadership and innovative school development using ICT, to harmonize different views and vocabulary regarding the uses of ICT in teacher education (UNESCO, 2008).

More three productivity factors that lead to growth based on increased human capacity which are: capital deepening (the ability of the workforce to use equipment that is more productive than earlier versions), higher quality labour (a more knowledgeable workforce that is able to add value to economic output), and technological innovation (the ability of the workforce to create, distribute, share and use new knowledge) were observed. These three productivity factors serve as the basis for the complementary and somewhat overlapping approaches that connect education policy with the technology literacy approach, the knowledge deepening approach and the knowledge creation approach. Based on the above, this study examined the technology literacy approach using the six components of the educational system.

Statement of the Problem

Technology is having an innovative influence on teaching and learning globally. Universities in Nigerian are part of a community of practitioner of ICT-supported teaching (Ololube, 2007). More so, UNESCO (2011) ascertained that in a viable teaching and learning environment, technology can enable teachers to be more comfortable. Provision of the right ICT tools and exhibition of adequate competence by teachers in the application of the application of ICT to teaching and learning enhances learning outcome. Teachers should develop certain literacy level that will help them maximize the use of ICT effectively as teaching resources. Teachers' competency on the use of ICT for teaching and learning revealed that their competency level are low. More so such studies related to tertiary institutions are very scanty and such studies dealt with the attitudes and use and do not state the literacy level of the lecturers. Therefore, there is need to for a study on technology literacy level of lecturers in tertiary institutions in Nigeria. In line with the identified gap, this study examined the perceived technology literacy level of lecturers using the technology literacy approach of the ICT Competency Framework for Teachers (ICT-CFT) (2011)

Purpose of the Study

The purpose of the study was to determine the perceived technology literacy level of lecturers using the technology literacy approach of the ICT Competency Framework for Teachers (ICT-CFT) (2011).

Research Question

1. What is the perceived technology literacy level of Nigerian university lecturers' using the policy aspect of UNESCO ICT Competency Framework for Teachers (ICT-CFT) (2011)?

Literature Review

Technology Literacy Approach of the UNESCO's ICT Competency Framework for Teachers

Information and Communication Technology (ICT) competencies are an essential part of teachers' in the 21st century and future classroom. The technical skills in the use of ICT by teachers enhance the teaching and learning processes. There are two main reasons for changing education. One reason is that the world is changing rapidly which demands new skills and knowledge, requiring schools to prepare teachers for the 21st century. The second reason is that by making use of new technologies, teachers can teach better based on the needs and wishes of the individual learner. A teacher's competence is made up of various areas that together make up the outline of what could be considered as an adequate or efficient use of these technologies. A teacher to be considered ICT competent, the teacher should be competent in at least five, closely related, areas which are the pedagogical area; know ledge of the social, ethical and legal aspects related to ICT use in teaching; skills for ICT based school management; the use of ICT in teachers' professional development; and the area of technical know-how.

ICT Competency Framework enables teachers to design and develop scheme which can be used for the professional development of teachers. Moreover, the standards and competencies in the Framework can be used as guidelines for planning technology based activities in which future teachers achieve success in the classroom and communicate effectively in the class. According to UNESCO (2008), by combining ICT skills and pedagogical knowledge with emergent educational views and concepts a rethinking of learning and profound changes in education may be brought about. At the global level, UNESCO designed a competency framework for teachers (ICT-CFT), which was launched in 2008 to help educational policy-makers and curriculum developers identify the skills teachers need to harness technology in education (UNESCO, 2008). The Competency Framework was developed in cooperation with Cisco, Intel, and Microsoft, as well as the International Society for Technology in Education (ISTE).The framework was created by crossing three approaches to ICT integration in education (Technology Literacy, Knowledge Deepening, and Knowledge Creation) with the six components of the educational system (Policy & Vision, Curriculum and Assessment, Pedagogy, ICT, Organization & Administration, and Teacher Professional Development) (UNESCO, 2011).

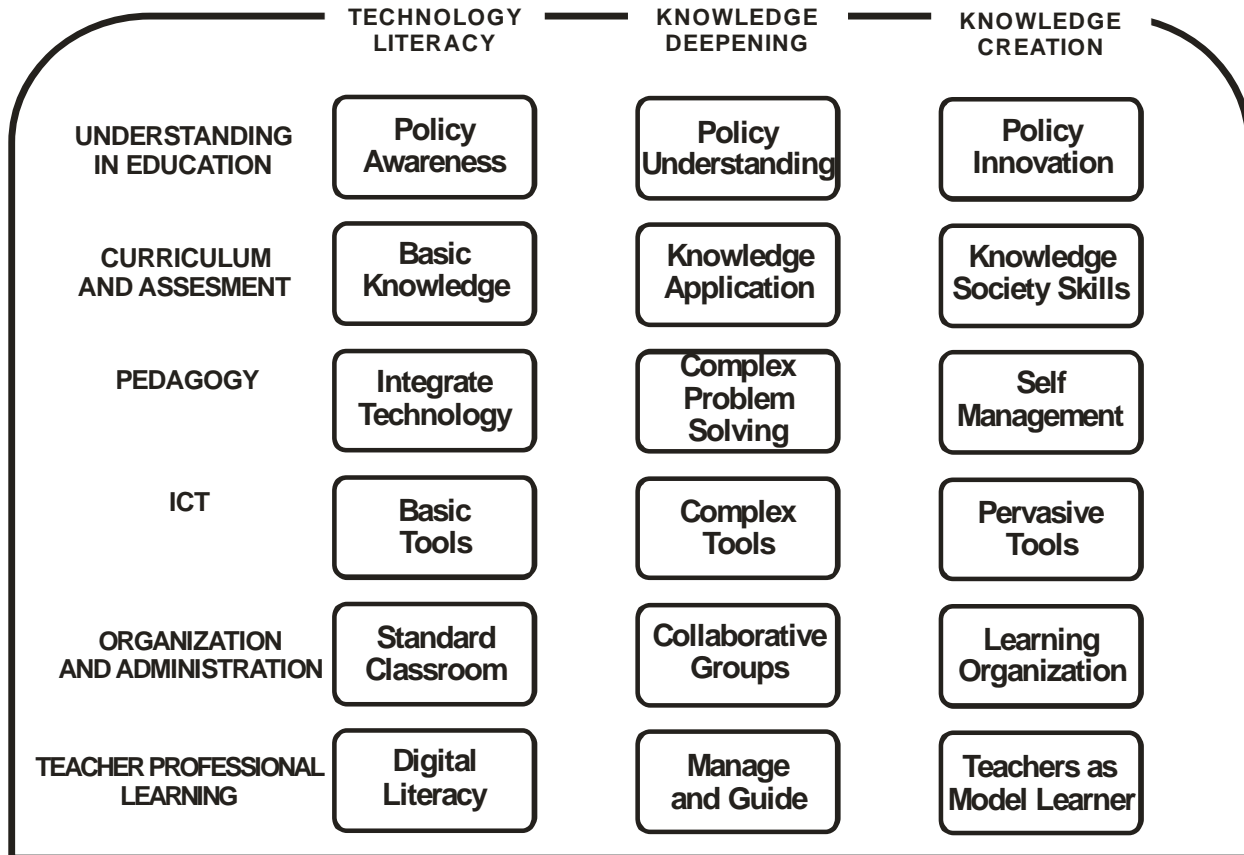


Figure 1: UNESCO ICT Competency Framework for Teachers Framework (ICT-CFT
 - 2011)

The framework specifies the competencies which teachers need in all aspects of their work by crossing the three approaches to teaching based on human capacity development (technology literacy, knowledge deepening, and knowledge creation) with the six aspects of a teacher’s work (understanding ICT in education, curriculum and assessment, pedagogy, ICT, organization and administration and teacher professional learning). The six aspects of teachers work are discussed as follows:

- **Understanding ICT in Education:** Teacher understands the basic principles of using ICT in teaching; which can also be used to change students’ attitude to learning and also collaborate with other teachers to help to improve on students learning when the ICT facilities are accessible.
- **Curriculum and Assessment:** The teacher realizes that using ICT would offer a new approach to one of the basic skills in the curriculum and also be able to include it in the curriculum information.
- **Pedagogy:** Teacher’s attitude to the use of ICT in teaching which also allows the student to use the ICT in the classroom while the teacher monitors the process.
- **ICT:** Teacher gets the available ICT equipment for use in the classroom.
- **Organization and Administration:** Teacher uses ICT to coordinate students learning. The teacher creates environments in the school’s learning management system which allows students to store, share and develop their work collaboratively.
- **Teacher Professional Learning:** Teacher uses ICT to source for resources to complement teaching, explains to colleagues how to use the resources and her own role in the use.

According to the UNESCO (2011), framework is organised in three different approaches to teaching which leads to the competency needs of the teachers. The first approach is Technology Literacy which enables students to use ICT to learn more efficiently. The second is Knowledge Deepening which enables students

to acquire in-depth knowledge of their study and apply it to solving complex, real-world problems. The third is Knowledge Creation that enables students, citizens and the labour force to create the new knowledge required for more harmonious, fulfilling and prosperous societies.

The current version of the ICT Competency Framework for Teachers is a 2011 update of the original version published in 2008, and is the result of the successful and continued partnership between UNESCO and CISCO, INTEL, ISTE and Microsoft. The framework has been enriched on the basis of feedback from subject matter experts and users worldwide, and enhanced with the inclusion of example syllabi and exam specifications for technology literacy and knowledge deepening. UNESCO and its partners aim to update this document on a regular basis, and we welcome feedback on the application of this ICT Competency Framework for Teachers

The UNESCO ICT-CFT (2011) presents three productivity factors that serve as the basis for three complementary and somewhat overlapping approaches to the framework for the competency needs of teachers as Technology Literacy Approach, Knowledge Deepening Approach and Knowledge Creation Approach.

Based on the UNESCO ICT-CFT, ICTs is already available at schools and where it is in the planning stages. The appendices can also be a valuable tool for government agencies in policy development in the field of education. They can be a source of reference information for teacher professional development programs and ICT competency needs of teachers. The UNESCO ICT-CFT (2011) also includes a detailed glossary of terms to facilitate the general understanding of the terminology on ICTs in education. To understand the ICT competency needs of teachers involves the teachers incorporating ICT into the classroom. Incorporating ICTs into the classroom requires teachers to learn about a very different approach to learning. It therefore requires a shift on the teacher's role from teacher to designer. Teachers must be skilled at locating, reusing, and adapting existing material, as they will have access to a larger array of content through the use of technology. Many of these content resources are freely available as Online Educational Resources (OER). Learning how to design and develop learning environments based on ICTs, before their use in the classroom, requires much more time. It is necessary to allow teachers significant time to develop their ideas, skills, and designs. Since it is difficult to involve all teachers in the innovation process at the same time, a gradual strategy could be adopted, which first involves those who innovate or take up innovation, often called early adopters. These early adopters are willing to take on the trouble and risk required in order to establish an innovative practice. However, it is important to note that this strategy does not exclude that other efforts can be made to get as many teachers as possible working to integrate ICTs in their classroom.

Methodology

Research Design: The design of the study was the descriptive cross-sectional survey research. The use of the design was on the fact that it is suitable for gathering data from a relatively large number of cases at a particular time.

Population: The population for the study consisted of lecturers from all the universities in Kwara State, Nigeria.

Sample and Sampling Technique: Multistage sampling technique was employed in the study. Firstly three universities (Al-hikmah University, Kwara State University, and University of Ilorin). were purposively selected from all the universities in Kwara State because of their years of establishment which is more than five years. Convenient sampling technique was used to select samples from lecturers. The general sample size was determined from the total number of lecturers in the selected universities during the 2016/2017 academic session. A total of 2,895 lecturers are in University of Ilorin, 198 in Al-hikmah University, while 530 are in Kwara State University, Malete. Thus, 3,623 lecturers are the target population for the study but 222 lecturers' were sampled for the study (See Table 1).

Table 1
Lecturers in Selected Universities

University	Total No	Selected Sample
University of Ilorin	2,895	112
Kwara State University, Ilorin	530	091
Al-hikmah University, Ilorin	198	019
Total	3,623	222

Research Instrument: The research instrument used to gather data for the study was a questionnaire designed by the researchers. The instrument was designed using the technology literacy approach of the ICT Competency Framework for Teachers (ICT-CFT) (2011). The six aspects were examined from policy, curriculum and assessment, pedagogy, ICT, teachers' professional development and organization and administration.

Procedure for Data Collection: The researchers personally administered the questionnaire copies on the respondents. After their consents had been received, each respondent responded to the questionnaire independently and returned immediately.

Data Analysis Technique: The data collected were analyzed using descriptive statistics (Mean) for the research question. Data collected were analysed using SPSS 20 for windows. A bench mark of 2.50 was used for the study.

Results

Table 2:

University Lecturers Perceived Technology Literacy Approach to Instruction

S/N	Policy : I Can	Mean
1.	identify key characteristics of classroom practices and specify how these characteristics serve to implement policies.	3.11
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S/N	Curriculum and Assessment: I Can	Mean
1	match specific curriculum standards to particular software packages and computer applications and describe how these standards are supported by these applications.	2.73
2.	help students acquire ICT skills within the context of their courses.	2.67
3.	use ICT to assess students' acquisition of school subject matter knowledge and to provide students with feedback on their progress using both formative and summative assessments.	2.62
	Average Mean	2.67
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S/N	Pedagogy: I Can	Mean
1.	describe how didactic teaching and ICT, can be used to support students' acquisition of school subject matter knowledge.	3.12
2.	incorporate appropriate ICT activities into lesson plans so as to support students' acquisition of school subject matter knowledge.	2.92
3.	use presentation software and digital resources to support instruction.	3.24
	Average Mean	3.09
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S/N	ICT: I Can	Mean
1	describe and demonstrate the use of common hardware technologies.	3.22

2.	describe and demonstrate the basic tasks and uses of word processors, such as text entry, editing text, formatting text, and printing.	3.41
3	describe and demonstrate the purpose and basic features of presentation software and other digital resources.	2.82
4	describe the purpose and basic function of graphic software and use a graphic software package to create a simple graphic display.	3.22
5	describe the Internet and the World WideWeb, elaborate on their uses, and describe how a browser works and use a URL to access a website.	3.42
	Average Mean	3.22

S/N	Organization and Administration: I Can	Mean
1	integrate the use of a computer laboratory into on-going teaching activities.	2.77
2.	manage the use of supplemental ICT resources with individuals and small groups of students in the regular classroom so as not to disrupt other instructional activities in the class.	2.54
3	identify the appropriate and inappropriate social arrangements to use with various technologies	2.59
	Average Mean	2.63

S/N	Teachers Professional Development: I Can	Mean
1	use ICT resources to enhance my productivity..	3.43
2.	use ICT resources to support my acquisition of subject matter and pedagogical knowledge..	3.56
	Average Mean	3.50

The result in Table 1 reveals a grand mean of 3.11 was accepted for University lecturers implementation of ICT policy in the classroom, a grand mean of 2.67 was also accepted for University lecturers implementation of ICT for curriculum and assessment and a grand mean score of 3.09 was accepted for University lecturers implementation of ICT for pedagogy. This indicates that University lecturers' can use ICT along with their teachings. A grand mean of 3.22 which is greater than 2.50 is accepted for the use of ICT for instruction by university lecturers. It is clearly understood from table 1 with the mean score of 2.63, university lecturers' can manage, organize and be a good administrator in the use of ICT for instruction. A grand mean of 3.50 indicated that the use of ICT for instruction has also help university lecturers in their professional development. This also translated to 75.92%. With this result, it is postulated that University lecturers' technology literacy approach to instruction is highly positive. This finding was negates the report of Ozoemelem's (2010) who reported that there was a low level of skills in the use of ICT in Nigerian universities. The results of the findings also agree with Beggs (2000) who reported that teachers should develop certain basic skills, such that will help them maximize the use of ICT effectively as teaching resources. Wong, Goh, Hanafi, and Osman (2010) also foundout that level of high literacy level is a good predictor for computer use among teachers. Similarly, Chai, Koh, and Tsai (2010); Hayes (2007) and Chen (2010) also reported that teachers' literacy level of technology help their use of ICT in teaching and learning processes.

Conclusion

University lecturers had a positive technology literacy approach to instruction in their delivery of instruction and also help in connecting education reform initiatives to the nation's economic and social development

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goals by explicitly including the 21st century skills that are needed to create new knowledge and engage in life-long learning (the ability to collaborate, communicate, create, innovate, and think critically) because teachers can effectively implement the use of ICT for instruction as required in the education system.

Recommendation

This study recommends that Government and University authorities should increase on the provision of new technologies and training of lecturers to prepare a workforce that is capable of taking up new technologies so as to improve economic productivity and also achieve the aim of developing the community through the university.

References

- Attwell, G. (2010). (a) Workbased Mobile Learning Environments: Contributing to a Socio-Cultural Ecology of Mobile Learning, in Pachler, N. (ed) Mobile Learning in the Context of Transformation. Special Issue of International Journal of Mobile and Blended Learning, December 2010.
- Beggs, T.A. (2000, April). *Influences and barriers to the adoption of instructional technology*, Paper presented at the proceedings of the mid-south instructional technology conference, Murfreesboro, TN.
- Chai, C. S., Koh, J. H. L. & Tsai, C. C. (2010). Facilitating preservice teachers' development of technological, pedagogical, and content knowledge (TPACK). *Educational Technology & Society*, 13(4), 63-73.
- Chen, R. S. (2010). Investigating models for preservice teachers' use of technology to support student centered learning. *Computers & Education*, 55(1), 32-43
- Dkit. (2013). *Transforming learning through technology: a policy for DkIT*. e-Learning Development Uni.
- Hayes, D. N. A. (2007). ICT and learning: Lessons from Australian classrooms. *Computer & Education*, 49(2), 385-395. <http://dx.doi.org/10.1016/j.compedu.2005.09.003>.
- Jegede, P. O. (2009). Assessment of Nigerian Teacher Educators' ICT Training Obafemi Awolowo University. *Issues in Informing Science and Information Technology*, 6.
- Knezek, G., & Christensen, R (2008). The importance of information technology attitudes and competencies in primary and secondary education, in J. Voogt & G. Knezek, (Eds.), *International Handbook of Information Technology in Primary and Secondary Education*, New York: Springer, 2008, 321-331.
- MacDonald, J. (2005). *Rules of engagement: Fostering active learning for performance improvement*,. Retrieved May 3, 2017, from http://www.iitsec.org/documents/E_2139_001.pdf
- Olafare, F.O. (2014). *Lecturers and students perceptions of computer-based test in selected Nigerian universities*, Doctoral Dissertation, University of Ilorin, Nigeria,
- Ololube, N. P. (2007). The relationship between funding, ICT, selection processes, administration, planning and the standard of science teacher education in Nigeria. *Asia-Pacific Forum on Science Learning and Teaching*, 8(1). Retrieved 15 December 15 2008 from http://www.ied.edu.hk/apfslt/v8_issue1/ololube/index.html abstract

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Ozoemelem, O. A. (2010). Web affinity: A study of undergraduate students in Nigerian universities. *Library Philosophy and Practice* [e-journal]. Retrieved on 15th April 2012 from <http://www.webpages.uidaho.edu/~mbolin/obuh2.htm>

UNESCO (2003) Rewarding literacy: a study of the history and impact of the International literacy

UNESCO (2008). ICT competency standards for teachers: policy framework Retrieved from UNESCO <http://unesdock.unesco.org/images/0015/001562/156210E.pdf>

UNESCO, (2011). UNESCO ICT Competency Framework for Teachers

UNESCO-IICBA (2012). CT Standards for African Teachers—Needs Assessment: Teacher Training Institutions in Focus. Addis Ababa: ECA.

Wong, K. T., Goh, S. C., Hanafi, H. F. & Osman, R. (2010). Computer attitudes and use among novice teachers: The moderating effects of school environment. *Malaysian Journal of Learning and Instruction*, 7, (3), 93-112. <http://mjli.uum.edu.my/index.php/joomla-home/category/7-mjli-vol.-7-2010?download=52>.

Woodford, C. (2014). A Brief history of computers. Retrieved from <http://www.explainthastuff.com/historyofcomputers.html>.